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VARIATION IN *ERIGERON GRANDIFLORUS* (ASTERACEAE: ASTEREAE) IN SOUTHWESTERN COLORADO

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ABSTRACT

In alpine tundra and fell fields in southwestern Colorado (San Juan Co.), individuals of *Erigeron grandiflorus* of extremely reduced size are common and abundant but previously undocumented in that size range — with stems 2–20 mm tall and involucres 5–7 mm wide producing 17–50 ray florets. The plants are monocephalous alpine perennials. A revised description of the species and photos of size variants, including the dwarf-like plants, are provided.
KEY WORDS: *Erigeron grandiflorus*, Astereae, variation, Colorado

The concept of *Erigeron grandiflorus* Hooker has recently been broadened to include plants previously identified as *E. simplex* Greene (Nesom & Murray 2004; Nesom 2006). Spongberg (1971) separated *E. simplex* (diploid) from *E. grandiflorus* (triploid, termed by Spongberg "the southern alpine race of *E. grandiflorus*") but distinguished them only by quantitative and broadly overlapping morphological features, with *E. grandiflorus* in the larger range. Nesom and Murray (2004) noted that practical separation of *E. simplex* from *E. grandiflorus* is arbitrary, even among collections identified by Spongberg, and adoped the earlier epithet to cover the whole range of variation (*E. grandiflorus* 1834 vs. *E. simplex* 1897).

We had an opportunity in 2010 to study populations of *Erigeron grandiflorus* in San Juan County, Colorado, and here present observations that extend the range of variability in the species toward smaller extremes than previously recorded. Figures 1–6 show plants from Stony Pass and the habitat, ca. 6.5 air miles east-southeast of Silverton, at an elevation of ca. 12,500 feet (*Heil 32,742* with O'Kane and Nesom). Measurements toward the smaller extremes are from plants observed and collected at Stony Pass and at Lake Emma (*Heil 32,743* with O'Kane and Nesom), ca. 5 air miles NE of Silverton, both on 22 July 2010.

Plants of *Erigeron grandiflorus* are perennials arising from a short, fibrous-rooted rhizome and characterized by a monocephalous habit, subscapose stems, entire leaves mostly in a basal rosette, and villous involucres. Essentially, we observed that in small areas on fell fields between 12,000 and 12,700 feet elevation, *E. grandiflorus* occurs in abundance as plants 2–20 mm tall, the shortest with heads barely above ground level. These plants also produce very small leaves (4–12

mm long) and small heads (involucres 5–7 mm wide, phyllaries 4–5 mm long) with rays few (17–50) and short (4–5 mm long) often in a single series, short disc corollas (2–2.3 mm long), and short cypselae (1.2–1.7 mm long). In plants at the upper range of height and head size, ray florets were produced in greater number and always in two series. Ranges of variation also appear to be continuous for other characters, but the larger plants are relatively fewer and in deeper soil at the edges of the fell areas.

Erigeron humilis Graham grows in abundance at both study sites but does not occur in the very shallow soil of the fell field with the smallest plants of *E. grandiflorus*, nor did we encounter dwarf-like plants of *E. humilis*. On the margins, in slightly deeper soil, and further outward, both *Erigeron* species grew intermixed. *Erigeron humilis* at Stony Pass: *Heil 32,744* with O'Kane and Nesom.

We suspect that the previous lack of accounting for the lower size range in *Erigeron grandiflorus* is more reflective of sampling bias than occurrence in nature, and individuals similarly reduced in size may occur over the range of the species. In any case, to encounter perennial plants of Asteraceae of such small size, in any type of habitat, is unusual in our experience.

Revised description of *Erigeron grandiflorus*.

Plants perennial, from short, horizontal or erect, fibrous-rooted rhizomes, caudex essentially unbranched or with short, thick branches. **Stems** 0.2–25 cm high, erect to basally decumbent-ascending, sparsely to moderately pilose to villous-hirsute, variably stipitate-glandular over whole or part of stem, sometimes essentially eglandular. **Leaves** basal and cauline, basal persistent, oblanceolate to obovate or spatulate, apically rounded, 1-nerved, (0.4–)1–6(–9) cm long, (1.5–)2–6(–14) mm wide, entire, cauline 1–3 on the proximal 1/4–1/2, quickly or gradually reduced upward, not subclasping, glabrous or glabrate to sparsely hirsutulous, villous, or sparsely strigose, sometimes sparsely glandular. **Heads** 1; involucres campanulate-turbinate, 4–8(–10) mm high, 5–20 mm wide; phyllaries in 2–3 subequal series, narrowly oblong-lanceolate, green or purplish, moderately to densely woolly-villous, sometimes with reddish crosswalls, minutely glandular at least near the tips, tips loose. **Ray florets** 17–130 in 1 or 2 series, corollas 4–11(–15) mm long, laminae white to blue, pink, or purplish, loosely coiling or not. **Disc corollas** 2–4(–5) mm long, narrowly tubular-funnelform, throat not indurate or inflated. **Cypselae** oblanceolate-oblong in outline, ca. 1.2–2.4 mm long, 2-nerved, sparsely strigose; pappus of (7–)10–22 bristles, with an outer series of narrow scales or a few inconspicuous setae. $2n = 18, 27$.

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Figure 1. Habitat of dwarf-like *Erigeron grandiflorus* at Stony Pass.

Figure 2. Dwarf-like plants of *Erigeron grandiflorus* at Stony Pass.

Figure 3. Dwarf-like plant of *Erigeron grandiflorus* at Stony Pass. Peduncle ca. 2 mm long.

Figure 4. Array of *Erigeron grandiflorus* individuals from fell field and alpine tundra habitat at Stony Pass showing trend toward extreme reduction in size. Peduncles ca. 2–120 cm in length.

Figure 5. Middle-sized plants of *Erigeron grandiflorus* at Stony Pass. Peduncles 8–9 cm in length.

Figure 6. Very small plants of *Erigeron grandiflorus* at Stony Pass. Peduncles 3–5 cm long; rays 17–25 in a single series.